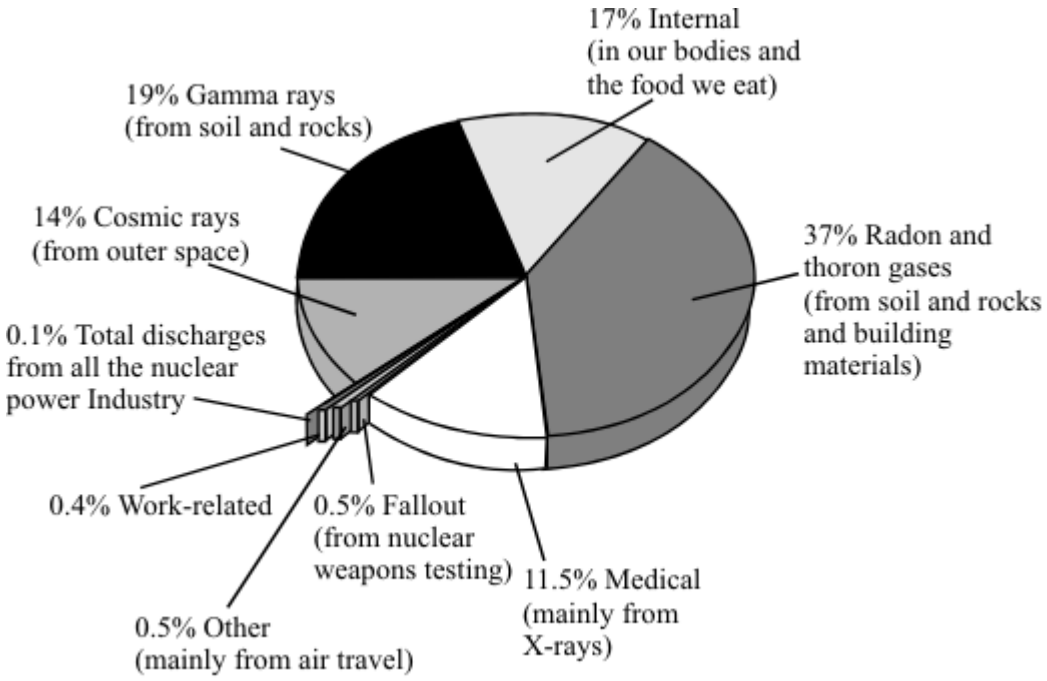
Name of the Student:_____

Max. Marks : 20 Marks **Time : 20 Minutes**

Q1.

The chart below shows the sources of radiation in Britain.



(a) Give **two** sources of natural radioactivity from the chart.

_____

(2)

(b) How might the chart be used to reassure people that nuclear power is safe?

_____

_____

_____

(1)

(c) Some material is spilled on a bench. How could you find out if this material is radioactive?

_____

_____

_____

_____

_____

(2)

(d) The table shows the proton number and mass number of two isotopes of iodine.

Iodine is found naturally in the world as the isotope I-127. Iodine-127 is not radioactive and is essential to life.
Other isotopes of iodine are formed in nuclear reactors. In the Chernobyl nuclear power station disaster in Ukraine an explosion caused a large quantity of the isotope iodine-131 to be released into the atmosphere. Iodine-131 is radioactive.

	proton number	mass number
iodine–127	53	127
iodine–131	53	131

Explain, in terms of particles found in the nucleus, how an iodine-131 nucleus is different from an iodine-127 nucleus.

_____

_____

(2)

(e) (i) Explain, as fully as you can, why iodine-131 could be harmful to our bodies.

_____

_____

_____

_____

(4)

(ii) Iodine-131 and iodine-127 have the same chemical properties. Explain why this would be a problem if iodine-131 was taken into our bodies.

_____

_____

_____

(1)

(iii) The Chernobyl disaster took place in 1986. Do you think that iodine-131 from the disaster is still a threat to us today? Explain your answer.

_____

_____

_____

(3)

(Total 15 marks)

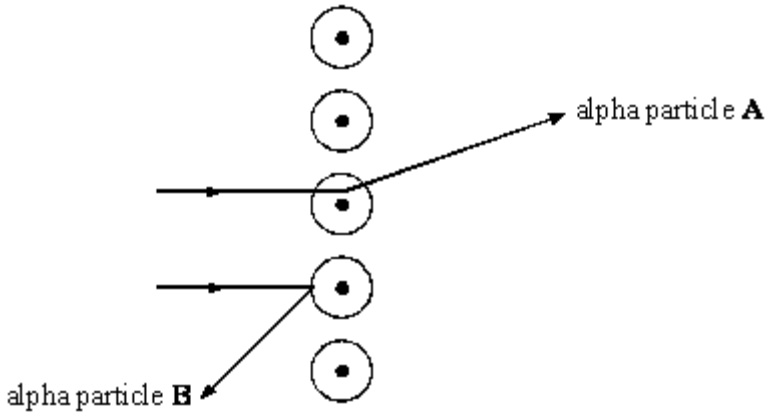
Q2.

(a) Atoms are made up of three types of particle called protons, neutrons and electrons.
Complete the table below to show the relative mass and charge of a neutron and an electron.
The relative mass and charge of a proton has already been done for you.

PARTICLE	RELATIVE MASS	RELATIVE CHARGE
proton	1	+1
neutron		
electron		

(2)

(b) The diagram below shows the paths of two alpha particles **A** and **B**, into and out of a thin piece of metal foil.



The paths of the alpha particles depend on the forces on them in the metal.
Describe the model of the atom which is used to explain the paths of alpha particles aimed at thin sheets of metal foil.

_____

_____

_____

(3)

(Total 5 marks)